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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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05/13/2005

Masayuki Hashimura

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EXAMINER

YEE, DEBORAH

ART UNIT

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/534,858	<b>Applicant(s)</b> MASAYUKI HASHIMURA ET AL.	
	<b>Examiner</b> Deborah Yee	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1, 2 and 4 to 10 is/are pending in the application.  
4a) Of the above claim(s) 7 to 10 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4 and 6 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicants' election of group I, claims 1, 2 and 4 to 6 in the reply filed on January 11, 2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).
2. Claims 7 to 10 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected invention, there being no allowable generic or linking claim.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by the computer-generated English translation of Japanese patent 2000-160284 (JP'284).
5. Example 5 in table 1 on page 4 meets the claimed composition and when calculated, has a Mn/S ratio = 1.756 (within the claimed Mn/S ratio of 1.2 to 2.8) and in table 3 on page 5 exhibits a high surface roughness (Ra) of 4.7  $\mu\text{m}$  (within inventive range of not more than 11  $\mu\text{m}$ ).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1, 2, and 4 to 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese patent 02047240 (JP'240) in view of Japanese patent 2000-160284 (JP'284).

8. Specific steel examples 12 and 19 of JP'240 in table 1 on page 268 meet the claimed composition and when calculated, satisfy the claimed Mn/S ratio of 1.2 to 2.8. Also MnS density of example 12 is  $2.3 \times 10^{-4} / \text{mm}^2$  and example 19 is  $9.6 \times 10^{-4} / \text{mm}^2$  which meet the claimed MnS density range of at least 10,000/ $\text{mm}^2$ . In addition, the English abstract discloses MnS dispersed in the steel having a diameter ranging from 0.1 to 10  $\mu\text{m}$ , which encompasses and therefore suggest Applicants' claimed range of 0.1 to 0.5  $\mu\text{m}$ .

9. Even though JP'240 steel does not contain 0.0005 to 0.05 wt% B as recited by the claims, such would not be a patentable difference. Note that it is well known in the metallurgical art that B is conventionally added to analogous steel to further enhance hardenability and reinforcement as taught by JP'284 in paragraph [0029]. Since hardenability and reinforcement are desired and sought properties by JP'240, then it would an obvious modification well within the skill of the artisan to incorporate B to JP'240 steel in view of the JP'284 teaching.

***Allowable Subject Matter***

10. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: The art of record does not teach or fairly suggest a steel superior in machinability having a composition, as recited by the claim 5, containing B in the amount between 0.002 to 0.014 wt% and S in the amount of 0.25 to 0.75 wt% such that the amount of S and B are within a region surrounded by A,B,C and D shown in Figure 4 where the contents of S and B satisfy the equation  $1, (B-0.008)^2 / 0.006^2 + (S-0.5)^2 / 0.25^2 \leq 1$  and steel contains sulfides with BN precipitated in the MnS.

***Response to Arguments***

12. Applicants' arguments filed January 11, 2008 have been fully considered but they are not persuasive.

13. Applicants argued that claims patentability define over JP'284. It was pointed out that the B addition according to the present invention is an indispensable element for increasing machinability whereas JP'284 is an optional element for enhancing hardenability. Furthermore, present invention combines B with N to form BN precipitates for enhancing machinability. It is the Examiner's position that regardless of the reason for adding B, steel alloy of JP'284 still contains  $\leq 0.005\%$  B which overlaps and therefore suggest Applicant's steel B range of 0.0005 to 0.05%. Although BN is not

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taught by JP'284, such would be expected since compositional limitations are closely met, and in absence of proof to the contrary.

14. In addition, Applicants argued that JP'284 only defines the lower limit of the Mn/S ratio at 1.70 with no upper limit whereas Applicant's claim 1 recites Mn/S being 1.2 to 2.8. Although an upper limit for Mn/S ratio is not taught by JP'284 as noted by Applicants, it does disclose specific steel examples 4 to 6 and 8 to 10 that meet or closely meet the claimed composition and when calculated, satisfy the claimed Mn/S ratio of 1.2 to 2.8. Hence claim would not patentably distinguish over prior art.

15. Applicants argued that claims patentably define over JP'240. It was stated that prior art steel does not contain B whereas claim 1 recites 0.0005 to 0.05%. It is the examiner's position that it is well known in the art to add small amounts of B to analogous machining steel alloys to further enhance mechanical properties, as evident by JP'284 and hence would be a matter of choice well within the skill of the artisan to incorporate.

16. It was submitted that JP'240 teaches controlling density and grain size of MnS to increase toughness of forged products. In contrast, present invention controls MnS to increase machinability. It is the Examiner's position that objectives are similar since higher toughness results in higher machinability. In any event regardless of the reasoning, JP'240 still meets the density and grain size limitations recited by the claims (see paragraph 8 above). Therefore claims would not patentably distinguish over prior art.

17. Applicants' argued that steel of JP'240 must contain one or more of Ti, Zr, Hf, Y, La, Ce and Mg for forming oxide whereas claim 1 does require these elements. This argument is not persuasive since the phrase "comprised" recited by present invention claim 1 is inclusive of unrecited element, even in major amounts. Also, present invention claim 6 recites one or more of said elements as alloying constituents.

### ***Conclusion***

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-272-1253. The examiner can normally be reached on monday-friday 6:00 am-2:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Deborah Yee/  
Primary Examiner  
Art Unit 1793

/DY/